Heritage-WTI, Inc.

E. Liverpool, Ohio

Startup, Shutdown, and Malfunction Plan Pursuant to the HWC MACT Regulations

Revision: 8

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1. INTRODUCTION

1.1 Program Objectives

As the operator of a facility which combusts hazardous waste, Heritage-WTI, Inc. (WTI) is required by the federal National Emission Standards for Hazardous Air Pollutant (NEHSAP) General Provisions at 40 CFR 63.6(e) to prepare and implement a Startup, Shutdown, and Malfunction (SSM) Plan for the facility. This plan is intended to document the procedures the facility must take during periods of startup, shutdown, and malfunction in order to minimize releases of hazardous air pollutants (HAPs). In addition, the federal Hazardous Waste Combustor Maximum Achievable Control Technology (MACT) requires a SSM Plan (63.1206(c)(2), which serves as the means for the facility to ensure compliance with the MACT emission standards during periods of time when the equipment at the facility is running outside the bounds of normal system operation.

Under the NESHAP General Provisions, a period of excess emissions associated with a startup, shutdown, or malfunction is not considered a violation of the MACT standards if:

- The SSM event is described in a facility's SSM Plan, and
- During the event, the operators of the facility follow and document conformance with the procedures laid out in the Plan.

The primary purposes of the SSM Plan, as listed in 63.6(e)(3), are:

- To ensure that MACT-affected sources are operated and maintained in a manner consistent with safety and good air pollution control practices for minimizing emission rates of HAPs during periods of equipment startup, shutdown, or malfunction;
- To correct process and emission control equipment malfunctions as soon as safe and practicable after their occurrence; and
- To streamline the reporting and recordkeeping obligations associated with periods of equipment startup, shutdown, or malfunction (including any corrective actions taken during periods of equipment malfunction).

1.2 Organization of the Plan

The SSM Plan for WTI is integrated into the Standard Operating Procedures (SOPs) for each of the operating units in the facility. For document control purposes, these procedures are maintained electronically on the facility's Intranet site. The procedures referenced in this Plan

are accessible to operators and other facility staff at computer workstations located throughout the facility.

The SSMP is organized as follows: Section 1 provides an overview of the Plan, as well as the specific regulatory citations that govern its preparation and implementation. Section 1 also contains a description of the WTI facility. Section 2 provides reference to the appropriate Startup, Shutdown, and Malfunction procedures for the Rotary Kiln and Secondary Combustion Chamber, the emission control systems, and the continuous monitoring systems, including both operating parameter and continuous emissions monitoring. Section 3 summarizes the reporting requirements for both routine reporting and non-routine reporting.

1.3 Regulatory Requirements

WTI is subject to MACT standards for Hazardous Waste Combustors (HWCs), codified commencing at 40 CFR 63.1200. These standards include the obligation to prepare a SSM Plan for the facility (40 CFR 63.1206(c)(2)).

The General Provisions section of the NESHAP lays out administrative procedures, compliance demonstration requirements, and other obligations for sources subject to MACT standards promulgated under the Federal air regulations in 40 CFR Part 63. These provisions, adopted on March 16, 1994, include a requirement that the owner or operator of a source subject to a MACT standard develop and implement a plan which describes the procedures to be followed for operating and maintaining the source during periods of startup, shutdown, and malfunction (40 CFR 63.6(e)(3)). The NESHAPs General Provisions require that the SSM Plan be in place prior to a source's MACT compliance deadline. The SSM Plan, typically, is not required to be reviewed and approved by regulatory agencies prior to its implementation. The HWC MACT Standards provide three alternative pathways for facilities to follow to develop their SSM Plan with respect to the treatment of malfunctions.

As described in the previous section, the SSM Plan must describe how process and HAP emission control systems will be operated so as to minimize HAP emissions during periods of startup, shutdown, and malfunction. When actions taken during a startup, shutdown, or malfunction (including actions taken to correct a malfunction) are consistent with procedures specified in the Plan, then any HAP emissions in excess of the MACT requirements which occur are considered periods of "excess emissions" rather than violations of the standard. Consequently, the owner or operator of the source must keep records to demonstrate that the facility's Plan was followed during such events. A semi-annual report is required to be submitted certifying that the Plan was followed during startups, shutdowns, or malfunctions for the reporting period. This reporting requirement is described in more detail in Section 3 of this plan.

If the actions taken are inconsistent with the Plan and an emission or operating parameter is not operated in accordance with MACT requirements, the owner or operator must conduct an investigation, recording the actual actions taken. Within two working days of the action, verbal notification (telephone or facsimile) is required, and within seven working days a written report containing an explanation of the circumstances, the reasons why the SSM Plan was not followed, and the excess emissions and/or monitoring exceedances that occurred. Section 3 repeats these reporting requirements in more detail.

During periods of time when hazardous waste is not present in the combustion chamber, Heritage-WTI documents that it complies with all otherwise applicable requirements and standards promulgated under sections 112 and 129 of the Clean Air Act (40 CFR 63.1206 (b)(1)(ii)) in lieu of the MACT standards set forth in 63.1203 and 63.1219 These applicable standards are found in Heritage-WTI's Title V Permit and corresponding Permits to Install. Exceedances of these emission standards are reported to the regulatory authority on a quarterly basis.

Emissions in excess of the MACT standards caused by an event that is not addressed, or inadequately addressed, by the SSM Plan require reporting. If the event meets the definition of a malfunction the SSM Plan must be revised within 45 days to address the malfunction. The revised Plan must include detailed procedures that will be followed to minimize emissions during similar events, as well as a program of corrective action for similar malfunctions (see 40 CFR 63.6(e)(3)(viii)). These requirements are included in Section 3 of this plan.

1.4 Document Control/Plan Change Procedures

1.4.1 Revision Notification/Submittal Requirements

The NESHAP General Provisions at 40 CFR 63.6(e)(3)(vii) describe how the SSMP may be required to be revised based on any of the following criteria:

- If it does not address an SSM event that has occurred,
- If its procedures do not adequately provide for minimization of emissions during an SSM event,
- If it does not provide adequate procedures for correction of a malfunction as quickly as possible,
- If it includes an event that does not meet the definition of startup, shutdown, or malfunction, or

- If changes are made to the facility equipment or operations that impact the SSMP.

If an SSM event occurs that is not addressed or is inadequately addressed by the SSMP and causes excess emissions, the required notification provisions described previously in Section 1.3 of this Plan are triggered (i.e., verbal notification to the regulatory agency within two working days, followed by written confirmation within seven days). In addition, the Plan must be revised within 45 days after the event (63.6 (e)(3)(viii)

Once the Plan has been revised, the superseded revision must be kept on record and made available for inspection upon request for a period of 5 years (63.6(e)(3)(v).

If the Plan is revised in such a way that it changes the scope of activities at the facility which are deemed to be a startup, shutdown or malfunction event, or if the revision otherwise modifies the applicability of an emission limit, written notice to the regulatory agency describing the revision must be made before the revised Plan can be considered to have gone into effect.

1.4.2 Internal Document Control Procedures

This document has been set up in a revision control format to aid with future additions, deletions and modifications to the SSM Plan. Possible reasons for SSM Plan revisions are described in the previous subsection.

General oversight of the SSM Plan will be the responsibility of the Environmental, Health and Safety (EHS) Department. This department will:

- Maintain File Copies of the plan;
- Be notified when needed changes are identified;
- Be notified of potential and/or actual non-compliance any of the items in this plan;
- Receive and review all data needed for reports;

The EHS Department will consult on SSM Plan issues with supervisors from Operations, Balance of Plant (BOP), Maintenance, and Electrical and Instrumentation (E & I) groups, providing guidance in the implementation of the SSM Plan. They will keep abreast of unit compliance status and any consistency problems between the plan and implementation of the plan. In the event of any inconsistencies or non-compliance the EHS Department will consult with management to ensure prompt attention to the issue, ensuring that the company take the most pro-active approach to minimizing releases into the environment. The EHS Department will compile all reports required by the air pollution control agency and will submit the reports at the specified intervals. The department will interface with agency personnel, and will respond to

inquiries from agency personnel concerning the plan. Finally, the EHS Department will report on the status of the plan's activities and the impact of the plan to appropriate plant personnel.

The SSM Plan will be kept electronically on WTI's ISO intranet system. In addition, the EHS Department will maintain at least two hard copies of the document.

Semi-annual reviews will be conducted with representatives of the EHS, Operations, and Maintenance supervisors to review performance and to discuss any needed revisions to the plan. The goals of the revision are to:

- Ensure continued compliance with state regulations;
- Update the plan to reflect current equipment, personnel, regulations, and procedures;
- Evaluate procedures and process malfunctions and determine whether changes are needed to individual procedures or to any parts of the Plan;
- Determine whether specific malfunctions in the Plan are necessary and sufficient for the current scope of the Plan.

Regular review of the Plan will ensure that it is responsive to the current needs and requirements.

As required by 40 CFR 63.1206(c)(2)(ii), changes to the Plan that may significantly increase emissions will be submitted to the Administrator within five days after making the change to the Plan. Similar to the initial approval procedure, the Administrator will notify the company of approval or intent to deny approval of the Plan within 90 calendar days after the receipt of the original request.

After initial implementation, each subsequent revision of the Plan must be kept on file and made available for inspection for a period of five (5) years after the revision is made. Revisions to the SSMP must be reported to the regulatory agency in the semi-annual report required by 40 CFR 63.10(d)(5), as discussed in Section 3.

1.4.3 Revision History

This plan was prepared and issued as Revision 0 on September 30, 2003. The first revision (Revision 1) was issued on February 27, 2004, adding new ESP OPL's and several malfunction events that were initially missed when developing the plan.

The second revision (Revision 2) was issued on June 23, 2005 and incorporated a revised section on operating modes (Section 1.6) as well as several other minor changes.

Revision 3 (10/25/06) of this plan was issued to reflect RCRA permit modifications and address new SSM events. Also during this revision, Heritage-WTI management made changes to the plan regarding reporting methods to align them more with industry norms.

Revision 4 (3/15/06) was issued to add malfunctions to the plan that may occur as the result of the failure of Combustion Enhancement Equipment and also to identify instances when exceedances may occur that are beyond the control of facility personnel.

Revision 5 (6/6/07) was drafted to further address events beyond the control of facility operators and management that could lead to an exceedance.

In September 2007, OEPA-DAPC noted that the plan contained some minor deficiencies regarding malfunction events for all OPL's and lacked an area describing how the facility plans to minimize the frequency and severity of the malfunctions. Revision 6 (10/16/07) addressed this issue.

In September 2008, WTI created Revision 7 (9/7/08) of the plan to reflect the facility's name change to Heritage-WTI, Inc.

Revision 8 (5/31/09) was produced in May 2009. This revision included, in Section 1.6.3.1, more detailed descriptions of the most common malfunction events that occur at the facility. It also included a description of data collection procedures during times when residence time expires while an exceedance event is taking place in Section 1.6.3.

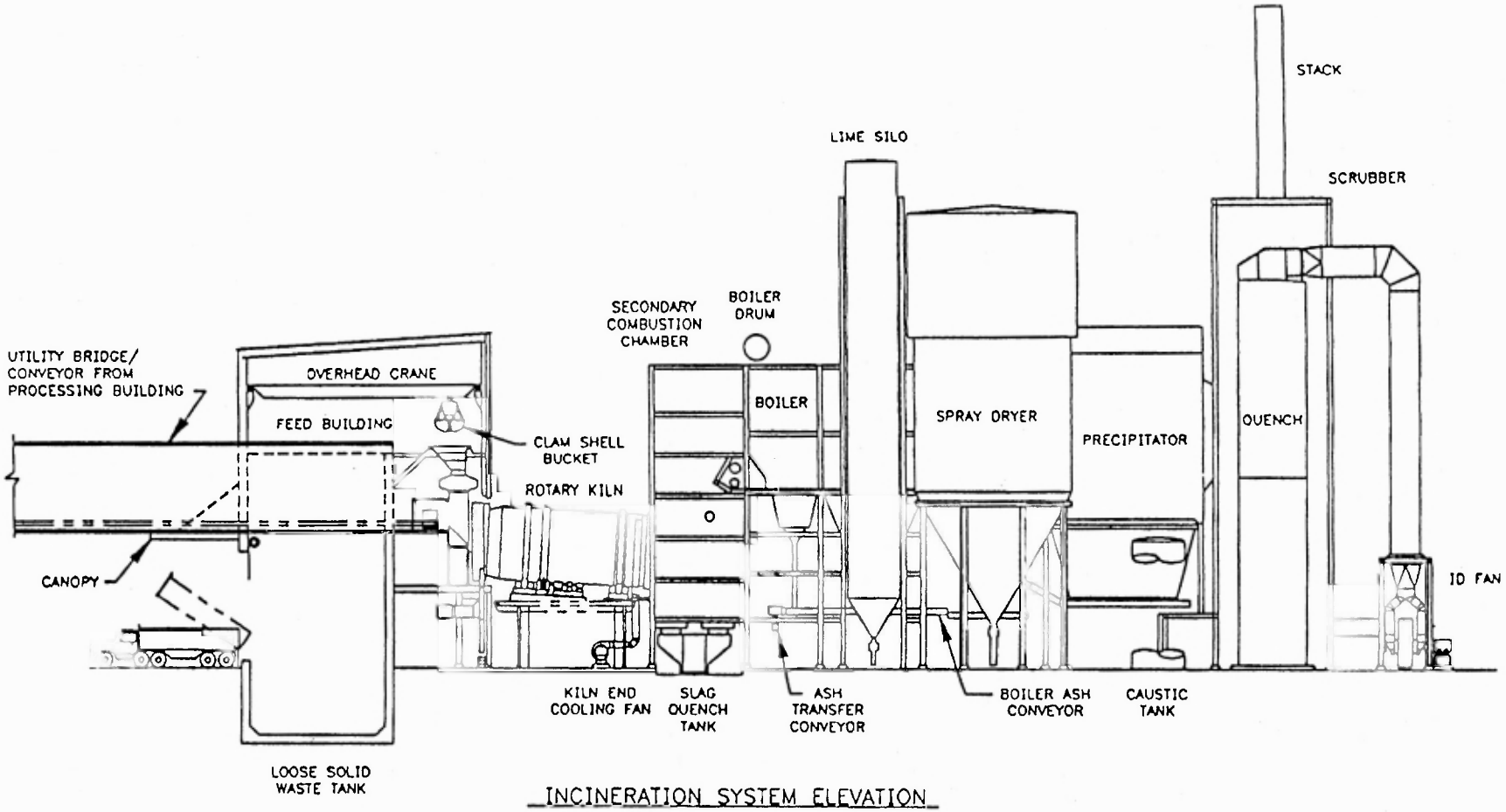
1.5 Facility and Combustor System Description

1.5.1 Facility Description

The WTI hazardous waste incineration facility treats organic and inorganic chemical wastes received from a wide variety of waste generators. The waste is stored, processed, managed on-site, and treated in a rotary kiln-base incineration system. The units associated with the facility include container storage, tank storage, treatment tanks, and the Incineration System. Figure 1-1 provides a general overview of the incineration and emission control systems at the facility.

Heritage-WTI, Inc. Startup Shutdown and Malfunction Plan

Figure 1-1



INCINERATION SYSTEM ELEVATION

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1.5.2 Combustor and Emission Control Systems Description

Wastes received at the facility are treated by thermal oxidation in a rotary kiln-based incineration system. This system includes a primary combustion chamber (rotary kiln) followed by a secondary combustion chamber to perform further treatment and complete the combustion process. The system also includes heat recovery and flue gas treatment units that are designed to maximize the treatment of wastes by the system and minimize releases to the environment.

A general description of the combustor and emission control systems is as follows: Wastes are fed to the kiln via a variety of feed mechanisms. Solid wastes in the form of slag move slowly from the front wall of the kiln to the discharge end. The slag flows into a Slag Quench Tank located at the base of the Secondary Combustion Chamber (SCC). The flue gas generated during the incineration process flows into the SCC for further treatment to complete the combustion process. From the SCC the flue gas enters the Heat Recovery Boiler, which reduces the temperature of the gas prior to entry into the Spray Dryer. The Spray Dryer unit further cools the flue gas and serves to evaporate neutralized process water from the facility's four stage Wet Scrubber. From the Spray Dryer, the flue gas enters the Electrostatic Precipitator (ESP) that removes the majority of the fly ash entrained in the flue gas. Once the fly ash has been removed the gases enter the Wet Scrubber, which is the final flue gas-cleaning unit in the system. The Wet Scrubber removes acid gas pollutants and fine particulate matter.

In addition to the emission control system components described above, WTI also employs other control systems to minimize or eliminate emissions. Activated carbon is injected into the flue gas stream at several points to reduce stack emissions of PCDDs/PCDFs and mercury. In addition, an Induced Draft (ID) Fan located between the Wet Scrubber and the Stack is used to convey the flue gas from the rotary kiln and SCC through the system and to provide negative draft, thereby eliminating fugitive emissions. Finally, prior to entering the stack the flue gases are reheated by the Plume Suppression system to ensure that the stack gases, mostly water vapor and carbon dioxide, will rise to an adequate height above the facility.

Analyzers are positioned at specific locations within the system to ensure compliance with emission limits and standards.

A Distributed Control System (DCS) controls the incineration system, as well as ancillary operations such as waste movement through the facility. Process parameters at critical locations are continuously recorded by the DCS and monitored by the facility's Control Room operator. The DCS is used to maintain key process parameters such as feed rates and operating conditions such as kiln temperature within permitted ranges. The DCS automatically stops waste feeds if certain process and operational parameters fall outside of the allowable operating range. A summary of the waste feed cut-off levels and operating parameter limits is provided in a subsequent section of this Plan.

1.6 Operating Modes

63.1207(g)(ii) provides that a facility may conduct testing under two or more operating modes to provide operational flexibility. WTI demonstrated only one mode of operation during the CPT. However, Subpart EEE emission standards and operating requirements are exempted during periods startup, shutdown, and malfunctions (see 40 CFR 63.1206(b)(1)(i)). Because of this exemption from Subpart EEE emission standards it is important to define these periods of startup, shutdown, and malfunction. Note that the exemption does not exempt a facility from reporting or recording requirements; however, exceedances of the emission standards and operating parameter limits during these periods are considered excess emissions rather than violations of the standard.

1.6.1 Startup

WTI is establishing in this plan that the startup period include both starting up the unit from a cold shutdown and turnaround after any particular part of the incineration system is shutdown, even if a complete shutdown to cold conditions did not occur. This startup period will end when hazardous waste is introduced into the incinerator. This can only occur after all AWFCO permissives are met.

1.6.2 Shutdown

Likewise, shutdown includes any period when any part of the incineration equipment is shutdown regardless of whether it was a manual or automatic shutdown. This period will end when emissions of any type from the affected source cease or when the source transitions into startup mode in preparation for waste feed.

1.6.3 Malfunctions

Malfunction is defined in 40 CFR 63.2 as *"any sudden, infrequent, and not reasonably preventable failure of air pollution control and monitoring equipment, process equipment, or a process to operate in a normal or usual manner which causes, or has the potential to cause, the emission limitations in an applicable standard to be exceeded. Failures that are caused in part by poor maintenance or careless operation are not malfunctions."* These malfunctions are identified in Table 2-2 of this document. Due to certain equipment failures and repairs, there may be periods during which the incinerator operates in what is termed "idle shutdown". WTI defines this period as when all AWFCO permissives have been met and hazardous waste residence time has elapsed. These periods may occur in order to make a much quicker transition to waste feed following an equipment repair. An exceedance of an emission

parameter during these periods should not be considered a violation as it would fall under the startup, shutdown, and malfunction.

This plan references WTI's standard operating procedures (SOP) for starting up and shutting down the incinerator and air pollution control equipment, as well as corrective actions to take when proper operation is interrupted. The DCS (Digital Control System) contains many interlocks that are designed to minimize emissions during periods of startup, shutdown, and malfunctions. For example, when starting the unit from a cold shutdown the DCS will not allow the front-wall gas burner to be operated until certain parameters are established, such as negative draft in the SCC. These interlocks are designed to both protect equipment and minimize emissions. The SOP for starting up the equipment outline the proper sequence when starting up the unit, however, if the operator does not follow the SOP, the DCS will not allow the startup of the equipment.

Events that can interrupt the proper operation of the equipment create alarms and also trigger Waste Feed Cutoffs and automatic equipment shutdown. These alarms are discussed in attachments to the operating SOPs. Pre-planning and automating immediate actions that are to take place when a system alarms ensures that the air pollution sources at this facility are operated and maintained in a manner consistent with safety and good air pollution control practices for minimizing emission rates of HAP's. Once again, many of the systems are interlocked; such that an event that interrupts the proper operation of the heat recovery boiler may immediately shutdown the ID fan. The shutdown of the ID fan automatically interlocks with other systems so that emissions are minimized, e.g. the primary air is shutdown automatically when the ID fan is shutdown to minimize fugitive emissions.

As discussed above, WTI only demonstrated compliance for one mode of operation. Normal operation mode includes operations when hazardous waste is being fed to the combustor and continues until the hazardous waste residence time has transpired. The HWC MACT Standard allows for operation under otherwise applicable standards after the hazardous waste residence time has expired (40 CFR Part 63.1209(q)). These otherwise applicable standards include those operating limits included in WTI's Title V permit and any operating parameters prescribed in WTI's RCRA permit.

When calculating rolling averages under different modes of operation, three methods of calculation are allowed. WTI utilizes the retrieval approach. When the residence time has transpired, the value for any MACT parameter is locked in, along with each minute of data used for calculating rolling averages. Upon the introduction of hazardous waste feeds to the unit, the first minute is added to the 59 minutes of data previously recorded for the MACT normal operation mode.

This retrieval approach is also used when a malfunction occurs. Consistent with the intent of the Startup, Shutdown, and Malfunction provisions, WTI operators are trained to go into a

voluntary shutdown when monitoring data indicates a system upset. This voluntary shutdown entails coming off of all waste feeds, at a minimum, and may continue into suspending fuel feeds when necessary. Once all waste feeds have been suspended, the operation staff begins investigating the cause and any corrective actions that can be taken to correct the parameter that triggered the shutdown. If the cause is a malfunction, then the minutes are considered bad minutes and not used in any rolling averages. If the cause is not malfunction related, then the rolling averages use the data.

At times it will be necessary for WTI to voluntarily enter MACT normal operation mode prior to initiating hazardous waste feeds. This will allow new parameter values to be added to the prior minutes in order to get an average that is acceptable for waste feeds under MACT normal operation mode. For instance, if we have a malfunction that causes the unit to be shutdown, the last 59 minutes of data may include temperature values that are not sufficient for waste feed to be initiated. WTI would voluntarily enter the MACT normal operation mode prior to initiating waste feeds such that the newer temperature values could be added to the previously recorded values. All other parameters, not just the chosen parameter, would also include minutes from this voluntary entrance into the MACT normal operation mode.

As stated previously, when the calculated residence time expires, the value of an OPL is locked-in. In such case that a value becomes locked-in during exceedance of a operating parameter, WTI will use the RAW minute-by-minute data to determine the duration of time that an exceedance event occurred. This is a logical approach since, theoretically, a locked-in value could cause an exceedance event to last for days if the incinerator were to initiate shutdown during a parameter exceedance and remain in that state for days or weeks. Events such as this occurred in July 2008 and again in August 2008.

The HWC MACT Standard also provides for a projected oxygen correction factor to be used during periods of startup and shutdown (see 40 CFR 63.1206(c)(2)(iii)). This projected oxygen correction factor is based on the oxygen content during normal operations corrected to 7% oxygen. The average oxygen concentration in the stack is approximately 15%, which yield a correction factor of 2.1 when corrected to 7% oxygen. Other than using this projected oxygen correction factor, all other data collected for Subpart EEE emission standards and operating requirements will continue to be collected, recorded, and used during periods of startup, shutdown, and malfunction when calculating rolling averages.

Exceedance of the standards and operating requirements are only exempt during periods of startup, shutdown, and malfunction if the procedures specified in this Plan have been followed. This exemption does not, however, provide exemption from the reporting requirements of 40 CFR Part 63.1211. Section 3 of this Plan provides a summary of the reporting requirements for SSM events.

Waste Feed Cutoffs - Waste Feed Cutoffs (WFCOs) are initiated when any of the following occur:

- When any operating parameter limits or emission standard monitored by a CEMS specified in Table 1-1 are exceeded
- When any feed parameter limits specified in Table 1-2 are exceeded
- When the combustion chamber pressure requirements are exceeded
- When the span value of any CMS detector is met or exceeded (excludes CEMS)
- When any component of the automatic waste feed cutoff system fails.

When a WFCO occurs, the [redacted] automatically stops all waste feed systems, initiating a warm shutdown. The operator is to follow the corrective actions provided in the Standard Operating Procedures (SOP) listed in Table 2-2. By following these corrective actions, facility operators minimize emissions and also initiate the steps to identify whether the condition was caused by an operational error or a malfunction. Regardless of the cause of the WFCO, the corrective actions of this Plan are followed. The cause of a WFCO must be identified as one of the following three categories:

(1) a WFCO caused by a malfunction that is identified in the Plan;

(2) a WFCO caused by a malfunction that IS NOT identified in the Plan; and

(3) a WFCO caused by operational error.

A malfunction is defined in 40 CFR 63.2 as follows:

> *A malfunction means any sudden, infrequent, and not reasonably preventable failure of air pollution control and monitoring equipment, process equipment, or a process to operate in a normal or usual manner which causes, or has the potential to cause, the emission limitations in an applicable standard to be exceeded.*

Therefore, if a WFCO is not caused by an event that meets the above definition, it is characterized as an Operational Error. This is an error caused, in part, by poor maintenance or careless or improper operation (Feb. 13, 2002 FR page 6800).

Section 3 reviews the reporting requirements for events that occur in each of these categories. Regardless of the category, data collected for Subpart EEE emission standards and operating requirements will continue to be collected, recorded, and used in calculating rolling averages.

As described in Section 1.5, the DCS is used to maintain key process parameters and automatically stops waste feeds and other processes if the process and operational parameters listed in these tables fall outside of the allowable operating range. This control system ensures that the facility complies with the operating requirements of MACT.

Exceedances of a MACT OPL during periods of startup, shutdown, or malfunction will be reported to the administrator semi-annually in the document titled *Semi-Annual Startup, Shutdown, and Malfunction Report* and *Semi-Annual Excess Emission and CMS Report* for Heritage-WTI Inc. These reports are required by 40 CFR 63.10.

WTI allows that during periods of startup, shutdown, and malfunction it is common to have several exceedances of MACT OPL's result from the same event. As such, Heritage-WTI will monitor, record, and investigate each occurrence. Exceedances of an OPL that have been determined to be caused by, or in relation to, a prior OPL exceedance will be reported in the semi-annual report and will be classified as malfunctions unless investigations show that an event occurred as the result of improper operation or maintenance.

1.6.3.1 Explanation of Common Malfunctions

Waste Feed Anomalies

Through its experience of operating a hazardous waste incinerator, WTI has discovered that there may be times when waste fed to the incinerator causes a disruption of the normal combustion process. These, in turn, can lead to exceedances of MACT parameters, typically THC and SCC Pressure events. Occurrences of this type are infrequent and can be very sudden. WTI takes measures prior to incineration attempting to ensure that all waste fed to the incinerator will properly combust. However, there are instances when this does not occur.

When these events cause the exceedance of a MACT OPL, WTI will investigate the event and attempt to determine a cause. A determination will then be made as to whether or not the event was reasonably preventable. Those that are not determined to be reasonably preventable or a definitive cause cannot be established will be classified as process malfunctions under the definitions and general provisions 40 CFR Part 63. WTI will utilize all relevant process data, employee accounts, historical performance, and other contributing elements to make this determination. Tools such as flow charts will also be developed to help ensure consistency in the decision making process.

Emergency Response

In order to protect the facility or its employees from the hazards of a particular waste stream, it may be necessary to charge material to the incinerator in a manner that contradicts normal feed guidelines. These instances may occur during an emergency response to a shipment that becomes unstable either during transport or while being stored at the facility. Because the

material may not be properly prepared for incineration, its feed to the incinerator may lead to exceedances of the MACT THC and SCC Pressure requirements. WTI will investigate these events as it does other events by using all relevant process data, employee accounts, historical performance, and other contributing elements to make this determination. Tools such as flow charts will also be developed to help ensure consistency in the decision making process.

Improper Customer Packaging

WTI is not required by its operating permit to open, inspect, or sample every waste shipment that arrives at the facility. Most often these instances occur when a waste stream has been determined to pose a reasonable threat to the safety of facility personnel. In these cases, WTI management provides customers with specific packaging instructions to ensure that the materials will combust properly when charged to the incinerator.

Because such materials cannot be inspected for proper packaging, instances may occur when material is received from a customer that has been improperly packaged. Instances such as this can lead to an exceedance of a MACT parameter such as THC or SCC Pressure. WTI will make the determination that a material was improperly packaged by a customer by reviewing shipping documents, evaluating other customer shipments past and present, and through direct contact with the customer. If the material is, in fact, found to be packaged improperly and procedures prohibited facility personnel from being able to make this determination prior to incineration, the event will be classified as a process malfunctions under the definitions and general provisions 40 CFR Part 63. Further action will be taken by WTI management to prevent the waste stream in question from causing future events. These actions may include customer re-training, warnings or suspension of future shipments.

Lance Plugging or Purging

WTI accepts a variety of liquid wastes for incineration at its facility. These wastes can contain sludge and some solids that have the potential inhibit flow through facility piping and the lance feed system. WTI has installed various devices such as agitators, strainers, and in-line shredders to help prevent plugging within these lines. Unfortunately, even with the installation of these devices, the flow interruption is still possible.

Flow interruption in a process line or lance can lead to an unexpected reduction of or inconsistent liquid flow to the incinerator. These situations can lead to poor combustion and possible exceedance of the THC standard.

It is also possible for material build-up with a line or lance to mount pressure and suddenly release itself into the incinerator. These purges are often unexpected and unpreventable and can result in poor combustion and abrupt pressure swings. If this or any of the abovementioned situations is determined to have caused the exceedance of a MACT operating parameter, WTI will classify the event as a malfunction of process equipment due to lance plugging or purging.

Lance Slagging

Just as plugging of a feed lance can disrupt combustion, so can slag build-up on a lance tip. Lance slagging occurs on the incinerator's feed lances when residual waste material accumulates on or around the lance tip, which can block / divert flow or impede atomization. Even though WTI operations personnel take regular preventative measures to thwart this condition, it can still occur without warning and result in poor combustion or loss of temperature. If this condition is determined to have caused the exceedance of a MACT operating parameter, WTI will classify the event as a malfunction of process equipment due to lance plugging or purging. This determination will only be made after a thorough inspection of the lance feed system and other possible causes have been ruled out.

Clinkers

Flue gas exiting the rotary kiln most often contains small particles of ash. These particles have the potential to accumulate on the sidewalls and ceiling of the Secondary Combustion Chamber (SCC). After a while, the weight of this build-up causes the ash to fall. At the base of the SCC is a water-filled tank used to quench slag falling out of the kiln. When these large masses of hot ash fall from the walls of the SCC and strike the water, a rapid expansion of steam may occur. This steam expansion has the potential to cause immediate pressure increases within the incineration system for which the operator is unable to compensate. These events can lead to failure to maintain MACT parameters for SCC Pressure and possibly THC.

WTI does not have the ability to regulate ash build-up on the SCC walls nor anticipate when the material will fall. As a result, when this occurs and leads to an exceedance of a MACT parameter, WTI will classify the event as a process malfunction.

System In-leakage

Air in-leakage into the process can have a minor effect on the combustion process. Air in leakage has a more pronounced effect on SCC pressure and process flow rate. As leaks develop in the system, the process flow rate increases since ambient air is drawn into the system by the negative draft induced by the ID fan. As the process flow increases and the system approaches its process flow limit, it becomes increasingly difficult for the ID fan to react to pressure excursions in the combustion area which can lead to SCC pressure exceedances. A secondary effect of the air in-leakage is that it can affect the oxygen correction factor for the CEMS data collected at the stack. Additional oxygen added to the system from ambient air in-leakage can raise the oxygen concentration in the stack which increases the oxygen correction factor.

Air in-leakage into the system can occur at any place in the incineration system. The effects of air in-leakage are very gradual since the leaks start small and increase over time, which makes is difficult in determining when and where the leaks exist. Leaks are indentified by process data, such as process flow rate, and visual inspections. Because these leaks can negatively affect system performance, WTI takes the necessary steps to repair leaks as soon a practical after they are identified. WTI may determine any exceedance of a MACT parameter to be a malfunction if previously unidentified system leak is found to be the primary cause.

Equipment/Instrument Malfunctions

The complexity and automation of the WTI incinerator dictates that the facility relies on instrumentation and other equipment to ensure that waste incineration is properly managed. The appropriate management of waste incineration includes appropriate waste introduction, maintenance of combustion controls, and accurate recording of data. There are hundreds of pieces of equipment and instruments that work almost continuously to maintain the incineration process. Even though WTI has numerous procedures in place to ensure that equipment and instrumentation is functioning properly, the potential still exists for unexpected and unpreventable malfunction. When these malfunctions are found to have directly led to the exceedance of a MACT operating parameter, WTI will classify these events as malfunctions due to failure of instrument or equipment and will take immediate corrective measures to repair the devices.

Boiler Tube Leaks

WTI maintains a Heat Recovery Boiler (HRB) as part of its incineration system, which reduces the temperature of the gas prior to entry into the Spray Dryer. The HRB is made up of thousands of tubes through which water passes and is heated by the flue gas. The heated water produces steam that is used in various processes at the facility. As is normal with all boilers, the tubes can become plugged or brittle leading to leaking of the water. Water leaking from the boiler tubes during operation can lead to poor combustion due to the cooling effect the water exerts on the flue gas. This poor combustion can cause exceedances of the MACT THC standards.

WTI takes steps to avoid the potential for boiler tube leaks but they are not entirely preventable. As a result, when WTI management determines that an exceedance event was caused by a boiler tube leak and the boiler tube leak is found to have been unexpected and reasonably unpreventable, the event will be classified as a malfunction.

General Power Failure

As with any industrial facility, WTI relies heavily on electricity to *operate*. Unfortunately, circumstances exist where electricity is not 100% available at all times. Electricity at WTI is provided by the local public utility. On occasion, supply to the facility is interrupted because of

environmental conditions, system malfunctions, or other extraordinary circumstances. Loss of electricity to the facility can lead to immediate and automatic facility shutdown. This shutdown can result in the exceedance of numerous MACT operating parameters. An emergency generator is in place to ensure that facility components vital to facility safety are still maintained but it will not prevent an immediate shutdown of the incinerator. WTI has also installed backup power supplies called Uninterruptable Power Supplies (UPS) to assist in maintaining instrumentation. Unfortunately, these also have the potential to malfunction and cause facility power loss. When power loss to the facility as the result of any of these causes and leads to exceedances of MACT parameters, WTI will classify these events as malfunctions.

Table 1-1

Conditions Required to Initiate Waste Feed[1]

Parameter	Condition Required
Minimum Feed Lance Atomization Pressure	Greater than or equal to 30 psig
Maximum SCC Pressure (PI-6002A/B)	Reference Sept. 4, 2003 letter from US EPA Region 5.
Maximum Temperature at ESP Inlet (TI-6002A/B)	428 °F (1-hr average)
Minimum Kiln Temperature (TI-4300A/B)	1,760 °F (1-hr average)
Minimum SCC Temperature (TI-4310A/B)	1,795 °F (1-hr average)
Maximum Process Gas Flowrate (FI-7510A/B)	67,581 scfm (1-hr average)
Minimum Carbon Feed Rate Location 1 (WF-7003)	[redacted]
Minimum Carbon Feed Rate Location 2 (WF-7002)	[redacted]
Minimum Carbon Feed Pressure Location 1 (PAL-5732)	2.9 psig (1-hr average)
Minimum Carbon Feed Pressure Location 2 (PAL-7132)	3.0 psig (1-hr average)
Minimum Ring Jet Pressure Drop (PDIC-7401)	27 in. w.c. (1-hr average)
Minimum Scrubber (1st and 2nd Packed Bed) Liquid Flow Rate (FQI-7201)	1,309 gpm (1-hr average)
Minimum Scrubber (Ring Jet) Liquid Flow Rate (FI-7404A/B)	454 gpm (1-hr average)
Minimum Scrubber (Ring Jet) Blowdown (FI-7403)	27 gpm (1 hr average)
Minimum Scrubber (Ring Jet) Tank Level (LIC-7401)	1.7 feet (1-hr average)
Total Power Input to ESP (EI-6700, EI-6710, EI-6720)	29.6 Kw (1-hr average)
Minimum Scrubber (1st and 2nd Packed Bed) Feed Pressure	Mfg. specifications
Minimum Scrubber (1st and 2nd Packed Bed) Pressure Drop (FQI-7200)	1.3 in. w.c. Mfg. specifications
Minimum Scrubber (3rd Stage) Liquid pH (AI-7307A/B)	7.5 (1-hr average)

[1] MACT Operating Parameter Limit as presented in Heritage-WTI America's Notice of Compliance submitted to the Administrator 6/17/04. The limit acts as both a required value prior to feeding waste and as a WFCO.

Table 1-1

Conditions Required to Initiate Waste Feed[1]

Parameter	Condition Required
Maximum THC emission limit (AI-7850)	10 ppm dry volume (as propane) corrected to 7% oxygen (hourly rolling average)
Current Input to ESP (EI-6700, EI-6710, EI-6720)	The ESP is operating with all fields available with set points of 45,000 volts and 90 sparks per minute, each field; and minimum current of 100 milliamps, each field (see US EPA letters dated Dec. 10 and Dec. 17, 2003).

Table 1-2

Feed Parameters

Description	MACT Value[1]
Maximum Pumpable Waste Feed Rate (WQI-9000T)	27,988 lb/hr (1-hr avg)
Maximum Total Waste Feed Rate (WQI-9000F)	34,026 lb/hr (1 hr avg)
Maximum Ash Feed Rate (WQI-9000AH)	8,440 lb/hr (12-hr avg)
Maximum Total Chlorine Feed Rate (WQI-9000CL)	2,828 lb/hr (12-hr avg)
Maximum Total Semi Volatile Metals	77.1 lb/hr (12 hr avg)
Maximum Total Low Volatile Metals	400.0 lb/hr (12 hr avg)
Maximum Total Pumpable Low Volatile Metals Feed Rate (WQI-9000LV)	400.0 lb/hr (12 hr avg)
Maximum Total Mercury Feed Rate (WQI-9000M)	0.82 lb/hr (12 hr avg)

[1] MACT Operating Parameter Limit as presented in Heritage-WTI's Notice of Compliance submitted to the Administrator 6/17/04. The limit acts as both a required value prior to feeding waste and as a WFCO.

2. SSM PLAN FOR THE INCINERATION SYSTEM

2.1 Startup and Shutdown Procedures for the Incineration System

The following table provides references to the appropriate WTI Standard Operating Procedures for startup and shutdown of the incineration system.

Table 2-1
Startup and Shutdown Procedures for the Kiln and Emission Control Equipment

Event	Procedure Title	WTI SOP Reference Number
Startup Procedures		
Starting the Rotary Kiln From a Cold Condition	Incineration System Integrated Startup	OP-8000-100
Starting the Secondary Combustion Chamber From a Cold Condition	Incineration System Integrated Startup Secondary Combustion Chamber Unit 4300 Pre-startup After Turnaround	OP-8000-100 OP-4300-100
Starting the Heat Recovery Boiler From a Cold Condition	Heat Recovery Boiler Systems Unit 5500 Startup After Turnaround	OP-5500-100
Starting the Spray Dryer From a Cold Condition	Spray Dryer System Unit 6000 Startup After Turnaround	OP-6000-100
Starting the ESP From a Cold Condition	Electrostatic Precipitator Unit 6600 Startup After Turnaround	OP-6600-100
Starting the Wet Scrubber From a Cold Condition	Scrubber System Unit 7200 Startup After Turnaround	OP-7200-100
Starting the Carbon Injection System From a Cold Condition	Carbon Injection Skids Startup	OP-8400-100

Table continued on the next page.

Event	Procedure Title	WTI SOP Reference Number
Starting Up the Process Monitoring Systems	Control Board Operation	OP-8100-100
Starting Up the Continuous Emissions Monitoring Systems	*Start up for the CEM System*	*CEM-100*
Starting the Rotary Kiln/SCC From a Warm Condition	Warm Condition Shutdown and Startup Procedure for the Incineration System	OP-8000-400
Starting the Spray Dryer From a Warm Condition	Spray Dryer System Unit 6000 Restart Following Loss of Power	OP-6000-110
Starting the ESP From a Warm Condition	Electrostatic Precipitator Unit 6600 Restart Following Loss of Power	OP-6600-110
Shutdown Procedures		
Shutting Down the Rotary Kiln/SCC to a Cold Condition	Incineration System Integrated Shutdown	OP-8000-200
Shutting Down the Heat Recovery Boiler to a Cold Condition	Heat Recovery Boiler Systems Unit 5500 Wet Layup Shutdown Heat Recovery Boiler Systems Unit 5500 Dry Layup Shutdown	OP-5500-300 OP-5500-301
Shutting Down the Spray Dryer to a Cold Condition	Spray Dryer System Unit 6000 Shutdown	OP-6000-300
Shutting Down the ESP to a Cold Condition	Electrostatic Precipitator Unit 6600 Shutdown	OP-6600-300
Shutting the Wet Scrubber Down to a Cold Condition	Scrubber System Unit 7200 Shutdown	OP-7200-300
Shutting the Carbon Injection System Down to a Cold Condition	Shutdown of Carbon Injection System, Unit 8400	OP-8400-300
Shutting the CEM System Down to a Cold Condition	Shutdown of CEM System	CEM-300
	Table continued on the next page.	

Event	Procedure Title	WTI SOP Reference Number
Shutting Down the Spray Dryer to a Warm Condition	Spray Dryer System Unit 6000 Shutdown	OP-6000-300

2.2 Malfunction Descriptions

Table 2-2 below provides references to the appropriate WTI Standard Operating Procedures for addressing malfunctions of the rotary kiln, secondary combustion chamber, and emission control technologies. Our way of organizing malfunction information is by events; events occur when a MACT operating limit is exceeded, as measured by CMS, or a MACT emission limit is exceeded, as measured by CEMS.

2.2.1 Minimizing Frequency and Severity

Heritage-WTI will follow the procedures listed in Table 2-1 as a means of minimizing the severity of each malfunction event listed in Table 2-2 and providing corrective action for the event itself. WTI will also conduct thorough investigations to determine the root cause of each malfunction. Further corrective action may also be taken as the result of the investigation. These additional measures may include performing facility maintenance, updating maintenance procedures, modifying processes, upgrading equipment, revising SOP's, etc. Also, as noted previously in this plan, the Automatic Waste Feed Cutoff (AWFCO) serves to reduce the severity of malfunction events. Heritage-WTI will, at all times, follow the procedures set forth in its Operation and Maintenance Plan, Continuous Monitoring System Plan, and this document to ensure that frequency of incinerator malfunctions are minimized.

Table 2-2
Process / Equipment Malfunctions and Relevant Heritage-WTI SOPs

Event	WTI SOP Reference Number	Malfunctions
Rotary Kiln and SCC		
General Power Failure	OP-8100-200	*General power failure can cause multiple malfunctions*
Low Rotary Kiln Temperature and Low Secondary Combustion Chamber Temperature	OP-4300-200	- Instrument Malfunction - Loss Of Lance Flow due to plugged lance or plugged strainers - Loss of Pump In Tank Farm - Boiler Tube Leak - Boiler malfunction, loss of medium pressure steam

Event	WTI SOP Reference Number	Malfunctions
		- Lance Slagging - RCRA Limit triggered WFCO, causing low kiln temp. - Feed Chute/ Front Wall coolant leak
Low Feed Lance Atomizing Pressure	OP-8100-200	- Instrument Malfunction - Medium Pressure Steam Set Point Malfunction - Pneumatic Control Valve Malfunction - Fouled Tubes in Boiler
Exceedance of Total Volumetric Flow Rate (Process Gas Flow rate)	OP-8100-100	- Instrument Malfunction - Belts On Reheat Fan broken affecting air flow - Reheat Fan is not Running - I.D. fan damper malfunction - SCC pressure ports plugged - System In-leakage from hole in system
Exceedance of Pumpable Waste Feed Rate	OP-8100-100	- Instrument Malfunction - Pump Malfunction - Valve Malfunction - Data Entry Error
Exceedance of Total Waste Feed Rate	OP-8100-100	- Instrument Malfunction - Flow Control Valve Malfunction - Scale malfunction on bulk solid crane - Data Logger Program malfunction - Data Entry Error
High Ash Feed Rate	OP-8100-100	- Planner Malfunction - Faulty Lab Analysis in ARTS - Check for bad DCS data - Data Entry Error
High Chlorine Feed Rate	OP-8100-100	- Planner Malfunction - Faulty Lab Analysis in ARTS - Check for bad DCS data - Data Entry Error
High Total Semi Volatile Metal Feedrate	OP-8100-100	- Planner Malfunction - Faulty Lab Analysis in ARTS - Check for bad DCS data - Data Entry Error
High Low Volatile Metal Feedrate	OP-8100-100	- Planner Malfunction - Faulty Lab Analysis in ARTS - Check for bad DCS data - Data Entry Error

Event	WTI SOP Reference Number	Malfunctions
High Total Pumpable Low Volatile Metal Feedrates	OP-8100-100	- Planner Malfunction - Faulty Lab Analysis in ARTS - Check for bad DCS data - Data Entry Error
High Total Mercury Feedrate	OP-8100-100	- Planner Malfunction - Faulty Lab Analysis in ARTS - Check for bad DCS data - Data Entry Error
High SCC Pressure	OP-8100-200	- Instrument Malfunction - SCC Pressure Ports Blocked - Loss of ID fan due to malfunction of other equipment - Atomizer malfunction - Clinker dropping into quench - Lower I.D. Fan Set Point - No Air To Damper - Dampers not operating properly causing excess air - Plugged Boiler - Kiln Shroud Seal Bad - Kiln Fan Malfunction - Kiln Damper Not Working - Kiln Seal Pressure Set Point not Adjusted - Kiln Seal Pressure Transmitter Malfunction - Boiler Tube Leak - Feed Chute/ Front Wall coolant leak - Waste Feed Anomaly - Emergency Response - Improper Customer Packaging - Air In-leakage from hole in system - Front Wall Punch Malfunction - Hole in Slag Quench Tank
High Total Hydrocarbons	OP-8100-200	- THC Monitor Instrument Malfunction - Wet O_2 Monitor Instrument Malfunction - Dry O_2 Monitor Instrument Malfunction - Other Instrument Malfunction - Lance Purging / Lance Plugging - Purging due to RCRA WFCO (e.g. low kiln temp. WFCO) - Boiler Pluggage / Fouling - Boiler Tube Leak

Event	WTI SOP Reference Number	Malfunctions
		- Feed Chute/ Front Wall coolant leak - Waste Feed Anomaly - System In-leakage from hole in system - Malfunction of Combustion Enhancement Equipment (SCC Steam Nozzles, SCC Oxygen Injection) - Malfunction of Kiln Shroud Blowers - Emergency Response - Improper Customer Packaging
Electrostatic Precipitator		
High ESP Inlet Temperature	OP-6600-200	- Instrument Malfunction - Plugged Head tank - Plugged Strainers - Plugged atomizer feed plate - N-3 Pump not running - Atomizer not running - Slurry hose not connected - No wheel on Atomizer
Minimum Secondary Current & Other AVC shutdowns	OP-6600-200	- Excessive dust buildup in fields or hopper from equipment malfunctions - Low current caused by damage to plate - High voltage shorts to ground due to mechanical failure / malfunction - ESP internal electronic malfunction - Malfunction in T/R - ESP ash conveyor malfunction - ESP ash discharge valves not functioning.
Scrubber		
Low Packed Bed Total Flow Rate (1^{st} and 2^{nd} Packed Bed)	OP-7200-200	- Instrument Malfunction - Check Strainers on Scrubber Pump - Check Scrubber Pump Discharge Pressure - Check Manual Isolation Valves on Scrubber - Check Scrubber Pneumatic Blowdown Valves - Inspect For Caustic Build Up in Packing - Control Logic Problems
Low Packed Bed Total	OP-7200-200	- Instrument Malfunction - Check Pump Discharge Pressure

Event	WTI SOP Reference Number	Malfunctions
Differential Pressure Across Packed Beds		- Check Sump Levels - Plugged Nozzles - Manual Isolation Valve - Packed beds have Caustic Buildup - Loss of ID fan due to other equipment malfunction
Low Scrubber (1st and 2nd Packed Bed) Feed Pressure	OP-7200-200	- Instrument Malfunction - Check Pump Discharge Pressure - Check Sump Levels - Plugged Nozzles - Manual Isolation Valve - Packed beds have Caustic Buildup - Loss of ID fan due to other equipment malfunction
Low Ring Jet Pressure Drop	OP-7200-200	- Instrument Malfunction - Ring Jet Pressure caused by malfunctioning pump - Ring Jet Pressure caused by malfunctioning flow valve - Ring Jet Flow slow caused by plugged strainers - Ring Jet Malfunction - Ring Jet Hose leak
Low Ring Jet Liquid Flow Rate	OP-7200-200	- Instrument Malfunction - Ring Jet Flow from Pump caused by pump malfunction - Ring Jet Flow from Pump caused by strainer problems - Check For Plugged Ring Jets - Check Manual Isolation Valve problems - Broken line - Faulty Check Valve - Control Logic Malfunction - Tank Level Inaccuracy
Low Ring Jet Tank Level	OP-7200-200	- Instrument Malfunction - Ring Jet Flow from Pump caused by pump malfunction - Ring Jet Flow from Pump caused by strainer problems - Check For Plugged Ring Jets - Check Manual Isolation Valve problems - Broken line - Faulty Check Valve - Control Logic Malfunction - Tank Level Inaccuracy
Low Scrubber Liquid pH	OP-7200-200	- Instrument Malfunction

Event	WTI SOP Reference Number	Malfunctions
		- Check Pump Discharge Pressure for Caustic Feed - Check Tank Level for Caustic Feed - Steam Temperature On Tank for Caustic Feed - Check Pneumatic Control Valve for Caustic Feed - Check Manual Isolation Valve for Caustic Feed - Isolation Valve Third Stage Inlet for Caustic Feed
Low Ring Jet Blowdown Rate	OP-7200-200	- Instrument Malfunction - Check Pump Pressure - Plugged Pump Strainers - Check Manual Isolation Valve - Stroke Blowdown Pneumatic Valve - Check For Plugged Nozzles
Carbon System		
Low Carbon Carrier Feed Pressure (Locations 1 & 2)	OP-8400-200	- Instrument Malfunction - Plug in the inlet filter of Blower Motor - Other blower motor malfunctions - Plug in hose
Low Carbon Feed Rate (Locations 1 & 2)	OP-8400-200	- Instrument Malfunction / Level Switch - Instrument Malfunction / Load Cell - Instrument Malfunction / Speed Control - - Instrument Malfunction / Other Instrument (noted in Ops. Log Book) - Carbon Day bin empty caused by malfunctioning vibrators - Carbon Screw Broken - Broken Chain On Drive for carbon screw - Carbon bridge in feed hopper - Blower Motor not operating properly - Plug in the inlet filter - Check Differential Pressure - Plug in hose - Control Logic Malfunction
High Stack Gas Opacity	OP-8100-100	- Environmental Conditions (e.g. high, low temperature) - Power Loss

Event	WTI SOP Reference Number	Malfunctions
		- Instrument Malfunction - Purge Air Failure - Ancillary Equipment Failure

2.3 SSM Plan Conformance Verification Procedures for the Rotary Kiln/SCC

Control Room Operators will utilize electronic checklist to document conformance with SSM Plan procedures.

3. Reporting Requirements

3.1 Periodic Reporting

Reporting requirements for the SSM Plan are discussed in 40 CFR 63.10 – Recordkeeping and Reporting Requirements and 40 CFR 63.6 – Compliance with Standards and Maintenance Requirements.

40 CFR 63.10 requires a semi-annual report be submitted that includes the following:

- A statement that the SSM Plan was followed during the reporting period;
- Identification of any instances where any action during startup, shutdown, or malfunction is not consistent with this plan;
- A report containing the number, duration, and a brief description for each type of malfunction that occurred which caused or may have caused any emission limit to be exceeded.

In addition, the report must consist of a letter containing the name, title, and signature of the owner or operator or other responsible official who is certifying the accuracy of the report. The permitting authority may request that this report be done on a more frequent basis.

3.2 Immediate Reporting

There are three non-routine events that require immediate reporting:

(1) Notification to the Administrator by telephone or facsimile within two working days after commencing actions inconsistent with the plan and exceeding any emission limitation;

(2) Written notification must follow within seven days after the event to the Administrator for the above telephone or facsimile notification.

(3) Excessive exceedance reporting is required for each set of 10 exceedances of an emission standard or operating requirement while hazardous waste remains in the combustion chamber (e.g. the incinerator has not been burned out) during a 60-day block period. A written report must be submitted to the Administrator within five calendar days of the 10th exceedance. The report must document the exceedances, investigation results, and the corrective measures taken.